

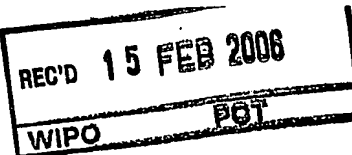
# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)





Applicant's or agent's file reference CDK2190	<b>FOR FURTHER ACTION</b> See Form PCT/PEA/416	
International application No. PCT/GB2004/004373	International filing date (day/month/year) 14.10.2004	Priority date (day/month/year) 16.10.2003
International Patent Classification (IPC) or national classification and IPC C02F5/14		
Applicant RHODIA CONSUMER SPECIALTIES LIMITED et al.		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 8 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
  - ☒ sent to the applicant and to the International Bureau) a total of 4 sheets, as follows:
    - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

- This report contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

Date of submission of the demand  16.08.2005	Date of completion of this report  14.02.2006
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  Grigoraki, E  Telephone No. +49 89 2399-8353 

**INTERNATIONAL PRELIMINARY REPORT  
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PCT/GB2004/004373

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

**Description, Pages**

1-5 as originally filed

**Claims, Numbers**

1-24 received on 22.08.2005 with letter of 16.08.2005

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application,
- ☒ claims Nos. 23,24

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):
- ☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 23,24 are so unclear that no meaningful opinion could be formed (*specify*):

**see separate sheet**

- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☐ no international search report has been established for the said claims Nos.
- ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form ☐ has not been furnished  
☐ does not comply with the standard

the computer readable form ☐ has not been furnished  
☐ does not comply with the standard

- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.
- ☐ See separate sheet for further details

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	2-4,6,7,13,15-17,21-22
	No: Claims	1,5,8-12,14,18,19-20
Inventive step (IS)	Yes: Claims	2-4,5-7*, 13,14-18*,21-22*
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-22
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

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**Conc. Section III:**

**Claims 23 and 24** refer to the description and as such are not allowable under the provisions of Rule 6.2(a) PCT. Since the scope of protection is not clearly/precisely defined therein, no meaningful examination as to novelty/inventive step can be carried out.

**Conc. Section V:**

*(Introductory remarks)*

Claim 1 has been amended to read "an anti-corrosion and anti-metal sulphide scale formulation....". The attention of the applicant is drawn to the fact that the definition of a functional feature as now introduced in claim 1 as well as the definition of the intended use in a product claim are not accepted as a clear limitation of the scope of protection for the product per-se, especially since it is possible to define the product by means of real product features (cf also remarks in item VIII below).

The scope of protection of now modified claim as the basis of IPER is thus considered essentially the same as the original one.

**Cited prior art:**

Reference is made to the following document:

D1: WO 99/46989 A1

**Claims 1,5,8-12,19-20 (product):**

D1 discloses a formulation comprising a THP<sup>+</sup> salt and an alcohol having an acetylenic bond as defined in present claim 1 (cf D1: page 6, l. 1-3; page 7, l. 10-11; claims, examples). Since the components of D1 are the same as the ones defined in claim 1 it must be assumed that the formulation of D1 is capable for the same use (cf also remarks in item VIII below).

D1 relates i.a to inhibition of deposition of iron sulphide in drilling operations and thus discloses the subject matter of claim 5 (cf D1: page 7, l.10-11) as well as of claims 8-12 (page 6, l. 1-3 of D1).

Furtheron the ratio between the THP<sup>+</sup> salt and the acetylenic alcohol shown in the examples of D1 falls within the ratio defined in present claims 19 and 20.

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>>D1 is therefore novelty destroying for the formulation of claims 1, 5,8-12,19-20.  
Consequently said claims do not fulfil the requirements of Article 33(2) PCT.

**Claims 14,18 (method).**

As is rendered clear from the above passage cited i.e page 7, l. 10-11, D1 deals i.a equally with a method for treatment of an aqueous system containing or in contact with a metal(=iron) sulphide scale by using the formulation of claim 1 i.e THP<sup>+</sup> salt and an acetylenic alcohol. Notwithstanding the fact that functional features are not necessarily accepted as representing real limitations in a method claim, since the formulation used in D1 falls within the definition of present claim 1 and is said to be able to be used to treat a system containing a metal sulphide scale, it must be assumed that the effect defined at the same time in the method claim 14 "...while concomitantly inhibiting the corrosion of surfaces in contact with said aqueous system" inherently applies.

In view of these remarks and contrary to the opinion expressed from the International Searching Authority, the method of claim 14 is considered by the International Examining Authority to lack novelty over the disclosure of D1. The same objection of lack of novelty applies to the subject matter of claim 18 the amount of which falls within the range claimed in D1.

**\*\*It is however noted that said method claims if transformed to use claims would appear to be allowable under Article 33(2) and (3) PCT.**

**Claims 2-4:**

The definition of the alcohol as in claims 2-4 is not derivable from the disclosure of D1 and would be able, if introduced into product claim 1 to establish novelty and, in view of the combined effect inhibition of metal sulphide scale and corrosion, an inventive step as required by Article 33(2) and (3) PCT could be accepted (cf also remarks in item VIII/A below).

**Claim 13:**

The use defined in claim 13, since the functional feature "for treating corrosion..." is regarded as limiting feature in a use claim, could be accepted for novelty /inventive step under Article 33(2) and (3) PCT.

**Claims 6\*,7\*, 15-17\*:**

It is noted that the subject matter of claims 6 and 7 (as well as of claim 5\*) is addressed to the type of scale which relates to the use of the product and as such is not a clear limitation of the product per-se (cf also item VIII). However these claims provided that they are transformed to dependent use claims would fulfil the requirements of Article 33(2) and (3) PCT.

The same applies to claims 15-17 provided that they are equally transformed to dependent use claims.

**Claims 21-22\*:**

Said claims, if dependent on claim 1 combined with claims 2-4, would also fulfil the requirements of Article 33(2) and (3) PCT.

**Conc. Section VIII:**

**A:**

The diol disclosed in D1 clearly falls within the definition of claim 1 "a primary, secondary or tertiary alcohol having an acetylenic bond in the carbon backbone".

If one considers the comparative example in Annex A filed with applicant's letter dated 16-8-2005, one must assume that not every alcohol as generally claimed in claim 1 is capable to solve the alleged problem i.e inhibit scale and at the same time effectively inhibit corrosion. Since the functional feature is not accepted for the purpose of limiting the scope of protection for the product per-se, said claim 1 must be objected under Article 6 PCT in the sense that it does not contain all essential features necessary to carry out the invention.

>>It appears that for this purpose it is merely a specific alcohol which is selected namely as defined in present claims 2-4.

As shown in the example in Annex A claim 1 covers alternatives which do not solve the problem, so that for these alternatives an objection of lack of inventive step may also be raised (technical problem not solved except for the alcohols covered by claims 2-4).

**B:**

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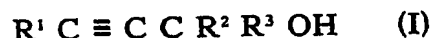
Claims 5-7 define merely the scale present in the system to which the claimed formulation is intended to be used. Said claims 5-7 not clearly limiting the scope of protection for the product per-se are objectionable under Article 6 PCT.



## CLAIMS

1. An anti-corrosion and anti-metal sulphide scale formulation for use in the treatment of corrosion and metal sulphide scale deposits in aqueous systems, said formulation comprising a THP<sup>+</sup> salt (as hereinbefore defined) and a primary, secondary or tertiary alcohol having an acetylenic bond in the carbon backbone.

2. A formulation as claimed in Claim 1, in which the acetylenic bond is adjacent to the hydroxyl group, said alcohol having the general formula (I):



wherein:

3. R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> (which may be the same or different) each independently represent hydrogen, C<sub>1</sub> to C<sub>8</sub> alkyl or functionally-substituted alkyl.

4. A formulation as claimed in Claim 2, in which R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> each independently represent hydrogen or C<sub>1</sub> to C<sub>8</sub> alkyl.

5. A formulation as claimed in Claim 3, in which the alcohol is propargyl alcohol.

6. A formulation as claimed in any one of Claims 1 to 4 in which the metal sulphide scale is iron sulphide.

7. A formulation as claimed in any one of Claims 1 to 4 in which the metal sulphide scale is lead sulphide.

8. A formulation as claimed in any one of Claims 1 to 4 in which the metal sulphide scale is zinc sulphide.

8. A formulation as claimed in any one of the preceding claims in which the THP<sup>+</sup> salt comprises an anion selected from the group consisting of sulphate, chloride, phosphate, bromide, fluoride, carbonate, citrate, lactate, tartrate, borate, silicate, formate and acetate.
9. A formulation as claimed in any one of the preceding claims, said formulation further including a surfactant.
10. A formulation as claimed in Claim 9 in which the surfactant is a cationic surfactant.
11. A formulation as claimed in Claim 10 in which the cationic surfactant is selected from the group consisting of quaternary ammonium compounds, N-alkylated heterocyclic compounds, quaternised amido-amines, and amino methane phosphonates.
12. A formulation as claimed in Claim 9 in which the surfactant is selected from the group consisting of anionic, amphoteric and non-ionic surfactants.
13. The use of a formulation as claimed in any one of the preceding claims for treating corrosion of mild steel, copper or aluminium.
14. A method for treatment of an aqueous system containing or in contact with a metal sulphide scale while concomitantly inhibiting the corrosion of surfaces in contact with said aqueous system, which method comprises the addition to said aqueous system of a scale and corrosion inhibiting amount of a formulation in accordance with any one of Claims 1 to 12.

15. A method according to Claim 14 in which the aqueous system is used in enhanced oil recovery.
16. A method as claimed in Claim 14 in which the aqueous system is used in industrial water systems.
17. A method as claimed in Claim 14 in which the aqueous system is used in paper manufacturing systems.
18. A method as claimed in any one of Claims 14 to 17 in which the THP<sup>+</sup> salt is added to the aqueous system in an effective amount of up to 30% by weight.
19. An anti-corrosion and anti-metal sulphide scale formulation consisting essentially of the reaction product of a THP<sup>+</sup> salt (as hereinbefore defined) and an acetylenic alcohol as claimed in any one of Claims 1 to 4, wherein the ratio of said THP<sup>+</sup> salt and said acetylenic alcohol is between 1:1 and 750:1.
20. A formulation as claimed in any one of Claims 1 to 12 in which the ratio of the THP<sup>+</sup> salt to the acetylenic alcohol is between 1:1 and 750:1.
21. A formulation as claimed in Claim 20 in which the ratio is between 15:1 and 300:1.
22. A formulation as claimed in Claim 21 in which the ratio is about 40:1.
23. A formulation substantially as described herein with reference to the accompanying example.

24. A method substantially as described herein with reference to the accompanying example.